



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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November 7, 2014

Mr. Robert Spelfogel
Hanscom AFB, 66ABG/CEIE
Building 1825, 120 Grenier Street
Hanscom AFB, MA 01731-1900

RE: Bedford
Transmittal No.: X260492
Application No.: NE-14-009
Class: *OP*
FMF No.: 131339
AIR QUALITY PLAN APPROVAL

Dear Mr. Spelfogel:

The Massachusetts Department of Environmental Protection (“MassDEP”), Bureau of Waste Prevention, has reviewed your Non-major Comprehensive Plan Application (“Application”) listed above. This Application concerns the proposed alteration and operation of a natural gas fired internal combustion engine driven chiller at your Central Heating Plant (Building 1201) located at Hanscom AFB, Bedford, Massachusetts (“Facility”). The Application bears the seal and signature of Lynne Santos, Massachusetts Registered Professional Engineer Number 47225.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 “Air Pollution Control” regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-N, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP’s review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator (“Permittee”) must comply in order for the Facility to be operated in compliance with this Plan Approval.

1. DESCRIPTION OF FACILITY AND APPLICATION

Hanscom Air Force Base is a base that does not have a flying mission; currently, the primary mission is research and development for electronic systems. The largest air pollution sources at the Facility are fuel burning equipment, the most significant of which are four oil and natural gas burning boilers, as well as several diesel powered emergency generators. The Facility is not classified as a major source of hazardous air pollutants (HAPs).

The natural gas engine driven chiller (Emission Unit 7 (EU7)) was approved for installation and operation in Approval MBR-97-COM-013, issued on November 26, 1997. Although EU7 was installed, it was never made completely operational and has not been operated for several years. In accordance with 310 CMR 7.02(3)(m), when permitted equipment has been idle for two or more years, it must obtain a new plan approval utilizing current Best Available Control Technology (BACT) emission standards before it can re-commence operations. As such the Permittee has proposed to modify the existing unit such that it will comply with current BACT emission standards and requirements rather than replace the unit with a new engine.

The Permittee has proposed to equip EU7 with a Selective Catalytic Reduction (SCR) system for control of nitrogen oxides (NO_x) and an oxidation catalyst for control of carbon monoxide (CO). The exhaust gases from the engine, at an approximate temperature of 703 degrees Fahrenheit, will pass through a Miratech, or equivalent, SCR/oxidation catalyst system which will result in NO_x emissions of 0.076 pounds per hour, and CO emissions of 0.503 pounds per hour. Potential noise impacts are mitigated because the engine is installed within the confines of Building 1201.

Applicable Regulatory Requirements

The Permittee shall comply with the National Emission Standards for Hazardous Air Pollutants ("NESHAP") for Stationary Reciprocating Engines, 40 CFR Part 63, Subpart ZZZZ.

2. EMISSION UNIT IDENTIFICATION

Each Emission Unit ("EU") identified in Table 1 is subject to and regulated by this Plan Approval:

Table 1			
EU	Description	Design Capacity	Pollution Control Device (PCD)
EU7	Engine driven Chiller with Caterpillar Model G3412C-LE, 4 stroke lean burn natural gas fired Engine.	4,874,850 BTU/hr	<ul style="list-style-type: none"> PCD1: SCR, Miratech EM12.120-12 (or equivalent) PCD2: CO oxidation catalyst, Miratech IQ2-22-12-H1 (or equivalent)

Table 1 Key:

EU = Emission Unit Number

BTU/hr = British thermal units per hour

CO = Carbon Monoxide

PCD = Pollution Control Device

SCR = Selective Catalytic Reduction

3. APPLICABLE REQUIREMENTS

A. OPERATIONAL, PRODUCTION and EMISSION LIMITS

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2:

Table 2					
EU	Operational / Production Limit	Air Contaminant	Emission Limit		
			lbs/MWh ³	lbs/hr	TPY ⁴
EU7	Natural gas shall be the <u>only</u> fuel fired The Permittee shall, to the extent practical, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions	NO _x	0.150	0.076	0.33
		CO ¹	1.00	0.503	2.21
			Average CO reduction of ≥ 93% or concentration ≤ 47 ppmvd at 15% O ₂ .		
		NH ₃	0.212	0.107	0.467
		CO ₂	1,650	831.0	3,638
		VOC ²	1.14	0.58	2.5
		PM ₁₀ /PM _{2.5}	0.030	0.015	0.066
		SO ₂	0.006	0.003	0.013
		HAP	Install an oxidation catalyst to reduce HAP as required by 40CFR63, Subpart ZZZZ Table2d, Item 9		
		Smoke and Opacity	Not to exceed limits contained in 310 CMR 7.06(1)(a) & (b)		

Table 2 Key:

EU = Emission Unit Number

CO = Carbon Monoxide

NO_x = Nitrogen Oxides

SO₂ = Sulfur Dioxide

NH₃ = Ammonia (Slip from use of urea in SCR)

CO₂ = Carbon Dioxide

VOC = Volatile Organic Compounds
PM₁₀/PM_{2.5} = total particulate matter/particulates which have particle sizes less than or equal to 10 microns/ particulates which have particle sizes less than or equal to 2.5 microns (PM_{2.5}), including filterable and condensable
HAP = Hazardous Air Pollutant

lbs/MW-hr = pounds per megawatt hour
lbs/hr = pounds per hour
TPY = tons per consecutive 12-month period
≥ = greater than or equal to
% = percent
O₂ = oxygen
ppmvd = parts per million by volume, dry

Table 2 Notes

- 1: Oxidation catalyst control efficiency for CO: 93%, while maintaining catalyst inlet temperature between 450 and 1350 degrees Fahrenheit (°F)
- 2: VOC emission factors from Environmental Protection Agency (EPA), actual VOC emissions may be significantly lower due to the oxidation catalyst
- 3: The BACT emission limits are consistent with Regulation 310 CMR 7.26(43), which sets forth emissions limitations that must be met by new internal combustion engines for the following air contaminants: NO_x, CO, and carbon CO₂
- 4: Based on 8,760 hours of operation.

B. COMPLIANCE DEMONSTRATION

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5:

Table 3	
EU	Monitoring and Testing Requirements
EU 7	1. The Permittee shall equip the subject unit with a fuel meter and recorder and all fuel usage shall be monitored.
	2. The Permittee shall, in accordance with 40 CFR § 63.6625, install and operate a continuous parameter monitoring system (CPMS) according to the requirements in paragraphs (b)(1) through (6) of 40 CFR § 63.6625. This system shall monitor the SCR urea solution injection rate, and operating temperature at the SCR inlet in order to maintain these parameters within the ranges recommended by the manufacturer to achieve compliance with the limits in Table 2.
	3. The Permittee shall maintain an adequate supply of spare parts, as recommended by manufacturer(s), on-site to maintain the air pollution control system and monitoring equipment serving the subject equipment.
	4. The Permittee shall ensure that the subject EU and PCD equipment can accommodate the emissions testing requirements as stipulated in 40 CFR Part 60, Appendix A or the latest test methods recommended by USEPA.
	5. The Permittee shall conduct compliance and emissions optimization testing for NO _x , CO, and NH ₃ within 90 days of the commencement of its continuous operation. All testing shall be conducted in accordance with the test methods and procedures set forth in 40 CFR 60, Appendix A and as required by 40 CFR 63 Sub-part ZZZZ. All compliance testing shall be witnessed by MassDEP personnel at a mutually agreeable date and time. The Permittee shall submit a test protocol for the required emission test for review and MassDEP approval at least 60 days prior to the anticipated date of testing. The Permittee shall submit the emission test results report to MassDEP's NERO within 60 days of completion of the compliance stack testing.

Table 3	
EU	Monitoring and Testing Requirements
EU 7	6. The Permittee shall perform inspections of the subject engine and control equipment as recommended by the manufacturers.
Facility-wide	7. The Permittee shall monitor all operations to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.
	8. If and when MassDEP requires it, the Permittee shall conduct emission testing in accordance with USEPA Reference Test Methods and Regulation 310 CMR 7.13.
	9. At least 30 days prior to emission testing, the Permittee shall submit to MassDEP for approval a stack emission pretest protocol.
	10. Within 45 days after emission testing, the Permittee shall submit to MassDEP a final stack emission test results report.

Table 3 Key:

EU = Emission Unit	NH ₃ = Ammonia
NO _x = Nitrogen Oxides	PCD = Pollution control device
CO = Carbon Monoxide	SOMP = Standard Operating and Maintenance Procedures
USEPA = United States Environmental Protection Agency	

Table 4	
EU	Record Keeping Requirements
EU 7	1. The Permittee shall record, using an electronic data logger, fuel flow, urea solution injection rate, temperature, and any other parameters monitored to ensure that the subject equipment operates within the ranges recommended by the manufacturer to achieve compliance with the limits in Table 2, and as required by 40CFR63 Sub-part ZZZZ. These records shall be maintained on-site for a minimum of five (5) years.
	2. The Permittee shall maintain adequate records on-site to demonstrate compliance status with all operational, production, and emission limits contained in Table 2 above. Records shall also include the actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve-month period (current month plus prior eleven months). These records shall be compiled no later than the 15 th day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping .
	3. The Permittee shall maintain a record of all startup, shutdown and malfunctions affecting air contaminant emission rates on the approved EU and PCD(s) and monitoring equipment. At a minimum, the records shall include: date and time the startup, shutdown, or malfunction occurred; description of the event; corrective actions taken; the date and time corrective actions were initiated and completed; and the date and time emission rates and monitoring equipment returned to compliant operation. Total NO _x and CO emissions emitted during the startup, shutdown, and malfunction shall be estimated and included in total reported emissions.

Table 4	
EU	Record Keeping Requirements
EU 7	4. The Permittee shall maintain a record of routine maintenance activities performed on the approved EU, PCD(s) and monitoring equipment. The records shall include, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.
	5. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EU and PCD(s) approved herein on-site.
	6. The Permittee shall maintain records of monitoring and testing as required by Table 3.
Facility-wide	7. The Permittee shall maintain records to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.
	8. The Permittee shall maintain records required by this Plan Approval on-site for a minimum of five (5) years.
	9. The Permittee shall make records required by this Plan Approval available to MassDEP and USEPA personnel upon request.

Table 4 Key:

EU = Emission Unit Number	PCD = Pollution Control Device
SOMP = Standard Operating and Maintenance Procedure	USEPA = United States Environmental Protection Agency
NO _x = Nitrogen Oxides	CO = Carbon Monoxide
NH ₃ = Ammonia	

Table 5	
EU	Reporting Requirements
EU 7	1. The Permittee shall submit a test protocol, describing the test methods and procedures for NO _x , CO, NH ₃ optimization/compliance testing, sampling point locations, sampling equipment, sampling and analytical procedures, and the operating conditions for the required testing to this Office, attention Bureau of Waste Prevention Permit Chief, for review and MassDEP approval at least 30 days prior to the commencement of compliance testing at the Facility. Startup and shutdown testing procedures shall also be included in this protocol.
	2. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a "Responsible Official" as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).
	3. The Permittee shall notify the Northeast Regional Office of MassDEP, BWP Permit Chief by email at NERO.Air@massmail.state.ma.us or fax at 978-694-3499, as soon as possible, but no later than three (3) business days after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to Permit Chief at MassDEP within ten (10) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).

Table 5	
EU	Reporting Requirements
EU 7	4. The Permittee shall submit the Final SOMP concerning the subject equipment to this Office, attention Permit Chief, Bureau of Waste Prevention, within 60 days of completion of the required initial compliance testing of the subject equipment. The Final SOMP shall include standard operating and maintenance procedures for Engine Driven Chiller and associated PCD.
	5. The Permittee shall submit any additional reports as may be required by 40 CFR Part 63 Subpart ZZZZ.
Facility-wide	6. The Permittee shall report annually to MassDEP, in accordance with 310 CMR 7.12, all information as required by the Source Registration/Emission Statement Form. The Permittee shall note therein any minor changes (under 310 CMR 7.02(2)(e), 7.03, 7.26, etc.), which did not require Plan Approval.

Table 5 Key:

EU = Emission Unit Number	PCD = Pollution Control Device
SOMP = Standard Operating and Maintenance Procedure	CO = Carbon Monoxide
NO _x = Nitrogen Oxides	NH ₃ = Ammonia

4. SPECIAL TERMS AND CONDITIONS

- A. The Permittee is subject to, and shall comply with, the Special Terms and Conditions as contained in Table 6 below:

Table 6	
EU	Special Terms and Conditions
EU 7	1. This Plan Approval, Tr. No. X260492, supersedes the Final Plan Approval, Tr. No. 127037, issued to the Permittee on November 26, 1997, in its entirety, except for technical information in the prior application that may have been relied upon in this Application.

Table 6 Key:

EU = Emission Unit Number
Tr. No. = Transmittal number

- B. The Permittee shall install and use an exhaust stack, as required in Table 7, on the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. The exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including, but not limited to, rain protection devices known as “shanty caps” and “egg beaters.”

- C. The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7, for the Emission Units that are regulated by this Plan Approval:

Table 7				
EU	Stack Height Above Ground (feet)	Stack Inside Exit Dimensions (feet)	Stack Gas Exit Velocity Range (feet per second)	Stack Gas Exit Temperature Range (°F)
EU 7	28.6	0.7	79-158	703

Table 7 Key:

EU = Emission Unit Number

°F = Degree Fahrenheit

5. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

- A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).
- B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.
- C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.
- D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.
- E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.

- F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.
- G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.
- H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.
- I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.
- J. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

6. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain “Fail-Safe Provisions,” which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

7. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Enclosed is a stamped approved copy of the application submittal.

Should you have any questions concerning this Plan Approval, please contact Thomas A. Hannah by telephone at 978-694-3287, or in writing at the letterhead address.

*This final document copy is being provided to you electronically by the
Department of Environmental Protection. A signed copy of this document
is on file at the DEP office listed on the letterhead.*

Thomas A. Hannah
Environmental Engineer

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Susan Ruch
Deputy Regional Director
Bureau of Waste Prevention

Enclosure

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